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10/820,596	04/08/2004	Isaac Keslassy	Keslassy 1-29-29-13	8107

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EXAMINER
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CLARK, MAXWELL A

ART UNIT	PAPER NUMBER
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4183

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/820,596	<b>Applicant(s)</b> KESLASSY ET AL.	
	<b>Examiner</b> MAXWELL A. CLARK	<b>Art Unit</b> 4183	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 08 April 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>04/08/2004</u> .  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Claim Objections***

1. Claims 2-20 objected to because of the following informalities: The use of the term “invention” is ambiguous because it is unclear whether Applicant is referring to the entire method of claim 1 or only a subset of claim 1, e.g. it is unclear what Applicant considers to be the “invention”. Appropriate correction is required.
2. Claims 2 and 14 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.
3. Claim 2 recites “scheduling each of the set of transmission matrices over the frame period, while the claim it depends recites “the set of transmission matrices representing the schedule over a frame period.” In each claim the limitation of setting or representing the transmission matrices over a frame period is present; hence, the dependent claim does not further limit the parent claim.
4. Claim 5 recites the limitation "R" in the equation. Applicant is required to clearly define each variable in the given equations.
5. Claim 14 recites “wherein step (c) decomposes the traffic matrix.” Claim 1, which claim 14 depends upon, recites “(c) decomposing, into a set of transmission matrices, a traffic matrix.” As such, claim fails to further limit claim 1.

### ***Claim Rejections - 35 USC § 112***

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claim 21 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

8. Claim 21 recites the limitation "the schedule" in line 6. There is insufficient antecedent basis for this limitation in the claim.

***Claim Rejections - 35 USC § 102***

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

10. Claims 1, 2, 21 are rejected under 35 U.S.C. 102(e) as being anticipated by Beshai et al. (USPN 6,768,718 B1).

11. Regarding claim 1, Beshai discloses a method of generating a schedule for two or more nodes of a network, the method comprising the steps of: (a) generating a network graph accounting for delay between each node of the network (col. 1, lines 33-48, wherein the modeling of the network corresponds to the network graph, (additionally, see fig. 10-13 which illustrates the network graph accounting for delay), the cost factor corresponds to the delay and the best route corresponds to the cost factor, i.e. delay; col.2, line 34-44, wherein the providing corresponds to generating, the

information including a route set corresponds to the network graph and the penalty criterion corresponds to delay); (b) generating a set of network constraints, i.e. load-adaptation vector, for the network graph, one or more of the network constraints based on the schedule accounting for each delay (col. 2, lines 46-52, wherein the network constraints correspond to the received traffic information and generating the set of constraints corresponds to the determining of adaptive routing information corresponding to each node; additionally see col. 9, line 43-55 wherein the load adoption vector, i.e. the network constraints, is assigned to the lowest-cost, wherein the cost corresponds to the delay (col.1, line 47)), as such the load-adaptation vector are based on the schedule accounting for each delay); and (c) decomposing, into a set of transmission matrices, a traffic matrix for the network graph based on the set of network constraints, the set of transmission matrices representing the schedule over a frame period (col.2, lines 37-57, wherein decomposing a set of transmission matrices corresponds to transmitting to each node the corresponding adaptive routing information, the traffic matrix, i.e. adaption vector, corresponds to the information setting the routing decisions for each node, i.e. demand matrix. Also see, col. 6, line 45-65 and col. 7, lines 25-47; col.6, lines 54-59, wherein the frame period corresponds to the traffic pattern scheduled during the time from the traffic matrix initialization until the traffic deviation metric, traffic deviation metric delta, threshold is exceeded). In addition, see citations regarding claim 21.

12. Regarding claim 2, Beshai discloses scheduling each of the set of transmission matrices over the frame period (col. 6&7, lines 66-67&1-24, respectively, wherein the

time intervals correspond to the frame period and the scheduling of the transmission matrices corresponds to the traffic matrix assignments).

13. Regarding claim 18, Beshai discloses the method implemented in a processor of a network controller coupled to the two or more nodes (col. 4, lines 30-63).

14. Regarding claim 21, Beshai discloses a network of nodes interconnected by links including a processor (fig.1, col.4, lines 30-35, wherein the graph of nodes corresponds to the network of nodes and the nodes include a controller, i.e. processor) comprising: first means for generating a network graph accounting for delay between each node of the network (fig. 9, col. 9, lines 20, wherein the cost corresponds to the delay and the network graph is each of the links and nodes specified); second means for generating a set of network constraints for the network graph, one or more of the network constraints based on the schedule accounting for each delay (col. 9, lines 43-55, wherein the networks constraints are defined by the load-adaptation vector which assigns the lowest-cost, i.e. delay, routes in each route set); and third means for decomposing, into a set of transmission matrices, a traffic matrix for the network graph based on the set of network constraints, the set of transmission matrices representing the schedule over a frame period (col. 9, line 33-35, wherein the traffic matrix quantifies the traffic demand, i.e. decomposing, into a set of transmission matrices, a traffic matrix for the network graph based on the set of network constraints, wherein the frame period is the time from the when the traffic pattern is assigned until it another traffic pattern is assigned due to the constraints). In addition, see citations regarding claim 1.

15. Regarding claim 22, Beshai discloses a computer-readable medium having stored thereon a plurality of instructions, the plurality of instructions including instructions which, when executed by a processor, cause the processor to implement a method for generating a schedule for two or more nodes of a network (col. 3, lines 34-37), the method comprising the steps of: (a) generating a network graph accounting for delay between each node of the network (col. 1, lines 33-48, wherein the modeling of the network corresponds to the network graph, the cost factor corresponds to the delay and the best route corresponds to the cost factor, i.e. delay; col.2, line 34-44, wherein the providing corresponds to generating, the information including a route set corresponds to the network graph and the penalty criterion corresponds to delay); (b) generating a set of network constraints for the network graph, one or more of the network constraints based on the schedule accounting for each delay (col. 2, lines 46-52, wherein the network constraints correspond to the received traffic information and generating the set of constraints corresponds to the determining of adaptive routing information corresponding to each node); and (c) decomposing, into a set of transmission matrices, a traffic matrix for the network graph based on the set of network constraints, the set of transmission matrices representing the schedule over a frame period (col.2, lines 37-57, wherein decomposing a set of transmission matrices corresponds to transmitting to each node the corresponding adaptive routing information, the traffic matrix, i.e. adaption vector, corresponds to the information setting the routing decisions for each node, i.e. demand matrix. Also see, col. 6, line 45-65 and col. 7, lines 25-47; col.6, lines 54-59, wherein the frame period corresponds to the traffic

pattern scheduled during the time from the traffic matrix initialization until the traffic deviation metric, traffic deviation metric delta, threshold is exceeded). In addition, see citations regarding claim 21.

***Claim Rejections - 35 USC § 103***

16. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

17. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

18. Claims 3-4 and 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beshai et al. (USPN 6,768,718 B1) in view of Beshai (US 2003/0185205 A1).

Regarding claim 3, Beshai 718 discloses traffic of the traffic matrix that decomposes the traffic matrix for the set of constraints (Beshai 718: col. 12, lines 57-67, wherein capacity matrix corresponds to the traffic matrix and the traffic allocation to the route sets corresponds to the decomposing of the traffic matrix).

Beshai 718 does not expressly disclose the frame period including an inter-schedule time of T, where the inter-schedule time is the time between scheduling each



of the set of transmission matrices and  $T$  is the total propagation time through the network. However, Beshai 205 discloses establishing new path/capacity modification of existing paths that are processed periodically where a core node can be reconfigured at designated instants, and each respective edge node is reconfigured at an instant that is determined to suit the core-configuration time. The minimum interval between successive reconfigurations is dictated primarily by the round-trip delay between a core node and the edge nodes (Beshai 205: pp. 3, ¶ [0026], wherein the new path/modification of existing paths corresponds to a schedule of a new traffic matrix, the designated instants or interval between successive reconfigurations corresponds to the frame period and the round-trip delay corresponds to the total propagation time through the network). Therefore, it would have been obvious to one of ordinary skill in the art at the time of the application to modify Beshai 718 B1, as taught by Beshai 205, to include a inter-schedule time scheduling each of the set of transmission matrices in the total propagation time for the purpose of disseminating over the entire matrix a unison rule prior to a new rule or traffic matrix becoming effective and also in order to maintain proper time locking in an environment where propagation-delay occurs to prevent collision.

Regarding claim 4, Beshai 718 in view of Beshai 205 discloses decomposing the traffic matrix for the set of constraints (Beshai 718: col. 2, lines 46-59, wherein decomposing the traffic matrix for the set of constraints corresponds to transmitting to each node the corresponding adaptive routing information for use by each node in making traffic routing decisions). Beshai 205 discloses scheduling transmission of data

through different channels at different starting times, i.e. framing period, where the unit of time delay is a time slot, i.e. frame period is multiple of the time slot, (Beshai 205: paragraph [0135]), reconfiguration-processing time, Y, i.e. frame period being a traffic pattern scheduled over a period of time, and delay, delta being a multiple of frame period Y, (Beshai 205: paragraph [00143]).

Regarding claim 12, Beshai 718 in view of Beshai 205 discloses setting the frame period to a total delay through the network (Beshai 205: paragraph [0026]).

Regarding claim 13, Beshai 718 B1 in view of Beshai 205 discloses time locking wherein all time counters in the network have the same period and all are synchronized in a conventional manner, i.e. a global clock and synchronizing the schedule of each node to the global clock (Beshai 205: paragraph [0138]).

Regarding claim 14, Beshai 718 in view of Beshai 205 discloses decomposing the traffic matrix (Beshai 718: col. 2, lines 46-58, wherein transmitting to each node the corresponding adaptive routing information for use by each node in making traffic routing decisions corresponds to decomposing the traffic matrix).

19. Claims 15-17 and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beshai et al. (USPN 6,768,718 B1) in view of Shachar et al. (US 2004/0037301 A1).

20. Regarding claim 15, Beshai discloses generating a network graph accounting for delay between each node of the network (Beshai: col. 1, lines 33-48, wherein the modeling of the network corresponds to the network graph, the cost factor corresponds to the delay and the best route corresponds to the cost factor, i.e. delay; col.2, line 34-

44, wherein the providing corresponds to generating, the information including a route set corresponds to the network graph and the penalty criterion corresponds to delay).

Beshai does not expressly disclose the network as a ring network of nodes interconnected by links in a ring configuration, the ring configuration having first and second logical rings coupled to corresponding first and second transmitter/receiver pairs. However, Sachar discloses multi-ring networks equipped with tunable receiver and transmitter wherein an additional sub-group of networks are coupled (Sachar: paragraph [0008-0009], for the purpose of increased aggregate traffic and collision avoidance, depending on the number of different wavelengths the receivers/transmitters are able to tune defines the number of logical rings corresponding to the transmitter/receiver pairs. It would have been obvious to one of ordinary skill in the art at the time of the application to modify Beshai, with Sachar, to include network rings configuration with different logical configurations to provide higher bandwidth, signaling/traffic assignment capabilities to the network while concurrently providing high qos by providing collision avoidance in accordance with the commonly used ring topology.

21. Regarding claim 16, Beshai in view of Sachar discloses a demand matrix based upon bandwidth requirements for node-to-node communication and a reservation map unit for creating a reservation map based upon the demand matrix, i.e. traffic matrix between the first and second logical rings, wherein load balancing the traffic corresponds to utilizing maximum matching data for communication among a plurality of nodes on the network (Sachar: paragraph [0014]).

22. Regarding claim 17, Beshai in view of Sachar discloses load balancing of the traffic includes the steps of uniformly distributing packets received at a node in the first logical ring to one or more buffers of the node, and transferring packets of the buffers to the second logical ring wherein the reservation map provides uniform load balancing based on demand data from the plurality of nodes. It is inherent that transferring packets from one logical ring to another, i.e. tuning the wavelength of the received signal to the wavelength of the transmitting signal, does not happen instantaneously. Therefore to prevent the data from being lost, the data must be temporally stored in some type of data buffer (Sachar: paragraph [0016]).

23. Regarding claims 19, Beshai in view of Sachar discloses the network as a ring network of nodes interconnected by links in a ring configuration (fig. 1a, fiber ring).

24. Regarding claims 20, Beshai in view of Sachar discloses a wavelength division multiplex ring, and each delay represents a propagation delay of a wavelength of each link wherein long distance between the optical elements, i.e. nodes, and the star coupler may require a special synchronization to overcome the optical delay, i.e. propagation delay of a wavelength, in the fibers (Sachar: paragraph [0139]).

***Allowable Subject Matter***

25. Claims 5-9 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Art Unit: 4183

26. Claims 10-11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

### ***Conclusion***

27. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Yemini; Yechiam et al., Morris; Todd D. et al., Mitra; Debasis et al., Malomsoky; Szabolcs et al., Lee; Byoung-Joon et al., Kodialam; Muralidharan S. et al., Kim; Michelle Yoonkyung et al., Donath; Wilm E. et al., Chang; Cheng-Shang et al.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MAXWELL A. CLARK whose telephone number is (571)270-1956. The examiner can normally be reached on Monday to Thursday 7:30A.M. to 5P.M. EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Len Tran can be reached on (571) 272-1184. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 4183

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

March 10, 2008

/Maxwell A. Clark/  
Examiner, Art Unit 4183

/Len Tran/  
Supervisory Patent Examiner, Art Unit 4183